vokes a very rapid decrease in the survival of this strain. As can be seen in Fig. 1, *E. coli* K_{12} meth⁻ is much more radioresistant than either of the *E. coli B* strains tested.

Thus it is evident that inhibition of protein biosynthesis following ultra-violet irradiation might lead to the restoration of some bacterial strains but to a decrease in viability in others.

The ability of bacterial strains to recover might have some relation (an inverse one) to their radioresistance. It is also possible that the uncoupling of RNA and protein synthesis, which occurs in the relaxed *E. coli* K_{12} meth⁻ strain, interferes in some way with the recovery process which is going on if both RNA and protein synthesis are inhibited or extremely limited. This last-mentioned possibility is at present being investigated in our laboratory by studying the biochemical mechanism of the recovery phenomenon.

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Unusual Reaction of Sweet Clover Seeds to X-radiation at Different Moisture Contents and to Post-irradiation Storage

Experiments have been performed to test the influence of seed moisture and post-irradiation storage on the radiation damage of sweet clover seeds (*Melilotus albus*).

Surprisingly it was not possible to establish an increasing radiation sensitivity by pre-irradiation drying, which would have been comparable to the well-known effects observed in barley and other crops[1-4]. Instead of this, two other observations were made:

(1) Post-irradiation storage in air was highly influenced by the relative humidity of the air. This is shown in Fig. 1. Air of 98 per cent relative humidity increased the inhibition of seedling growth markedly, not depending on the seed moisture at the time of irradiation. Air of 20 per cent relative humidity was not effective in changing the initial radiation damage. However, post-irradiation storage in air of the same relative humidity as before the irradiation (in equilibrium to the seed moisture at the time of irradiation) resulted in a remarkable increase of damage at humidities higher than 65 per cent (equal to seeds containing more than 11 per cent moisture), but led to some kind of recovery in seeds with 10·5 and 8·5 per cent moisture.

An additional experiment with barley seeds, conducted under the same experimental conditions to check their qualification, led to a convincing reproduction of the reactions published earlier by other authors and proved our experimental design as suitable (Fig. 1).

(2) Another experiment, which was carried out to test the effects of different periods of post-irradiation storage on seeds with different moisture content, gave strong evidence for the existence of two types of factors, acting alternately during this storage period: one factor increasing the damage and another leading to recovery, especially in seeds with low moisture content (Fig. 2). The reactions were similar for survival as for seedling height.

These are not yet fully understood, but they may be helpful in explaining the abnormal behaviour of sweet clover seeds, as demonstrated in Fig. 1. It may be reasonable to compare this recovery phenomenon with the

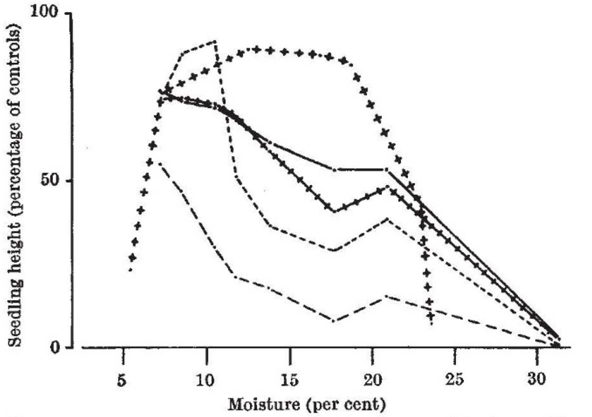

Fig. 1. Seedling height of irradiated sweet clover and barley seedlings as influenced by the moisture content of the seeds during the irradiation and relative humidity of the air during post-irradiation storage (20°–22° C). —, Sweet clover sown immediately after irradiation; - - - - - -, sweet clover sown after 14 days post-irradiation; storage, relative humidity corresponding to the seed moisture during irradiation; — — — — —, sweet clover sown after 14 days post-irradiation storage in 98 per cent relative humidity; —ı—ı—ı—ı—, sweet clover sown after 14 days post-irradiation storage in 20 per cent relative humidity; + + + + +, barley sown 24 h after irradiation

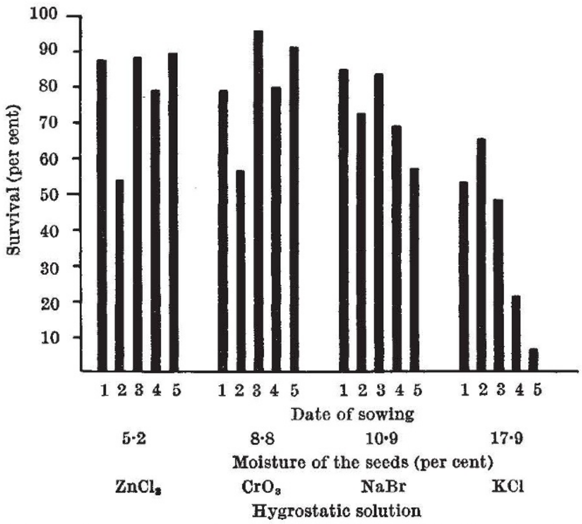

Fig. 2. Survival of irradiated sweet clover seeds with different moisture content after post-irradiation storage in the corresponding relative humidity for 0, 1, 4, 18 or 57 days (20°–22° C)

'thermorestoration' in dry bacterial spores described by Webb *et al.*[5], and with the recovery observed by Wolff and Sicard[6] after post-irradiation storage of desiccated seeds in 'normal' humidity.

The barley and sweet clover seeds were both equilibrated in air, irradiated in air and soaked in the presence of air on moist filter paper for several hours before sowing. For the first sowing only about 5 min elapsed between the end of irradiation and the beginning of soaking. In the second experiment with sweet clover this time was shortened by a 1-min infiltration of the seeds with a water suction pump. The radiation doses were 40 kr. at 460 r./min for sweet clover in the first experiment (Fig. 1), 10 kr. at 750 r./min for barley (Fig. 1) and 80 kr. at 1,400 r./min for sweet clover in the last experiment (Fig. 2).

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